

CLAIMS

- 1 1. A method for managing a data service from a management terminal in a
2 distributed computer system having a host computer system with a lookup
3 service and at least one storage device connected to the host computer system
4 by driver software, the method comprising:
5 (a) running, in the host, management facade software that controls data
6 passing between the driver software and the storage device and that
7 retrieves attributes of the data service;
8 (b) running, in the host, a federated bean that exports an interface containing
9 methods that generate commands to the management facade;
10 (c) using the lookup service to obtain a proxy to the federated bean; and
11 (d) in response to commands received from the management terminal, using
12 the proxy to make method calls on the federated bean interface to cause
13 the management facade to control the data passing between the driver
14 software and the storage device and to retrieve data service attributes in
15 order to manage the data service.
- 16 2. The method of claim 1 wherein step (d) comprises using a command line
17 interface in the management terminal to generate the commands.
- 18 3. The method of claim 1 wherein step (d) comprises using a graphical user
19 interface in the management terminal to generate the commands.
- 20 4. The method of claim 1 wherein step (a) comprises inserting a SCSI terminal
21 emulation interface layer between the driver software and the storage device,
22 which interface layer makes the storage device appear as a SCSI device.

- 1 5. The method of claim 1 wherein step (a) comprises inserting a storage volume
2 interface layer between the driver software and the storage device, inserting an
3 additional data service interface layer between the storage volume interface layer
4 and the storage device and using the storage volume interface layer to divert
5 information passing between the driver software and the storage device to the
6 additional data service layer.
- 1 6. The method of claim 1 wherein the distributed computer system comprises a
2 plurality of host computer systems each having at least one storage device
3 connected to the each host computer system by driver software and step (a)
4 comprises running in each of the plurality of hosts, management facade software
5 that controls data passing between the driver software and the storage device in
6 the each host and that retrieves attributes of the data service; and step (b)
7 comprises running, in each host, a federated bean that exports an interface
8 containing methods that generate commands to the management facade in the
9 each host.
- 1 7. The method of claim 6 wherein step (c) comprises using the lookup service to
2 obtain a first proxy to a first federated bean in one host computer system and
3 using the first proxy to control the first federated bean retrieve a second proxy of
4 a second federated bean running in a second host.
- 1 8. The method of claim 7 further comprising:
2 (e) using the second proxy to control the second federated bean from the first
3 host computer system.
- 1 9. Apparatus for managing a data service from a management terminal in a
2 distributed computer system having a host computer system with a lookup

3 service and at least one storage device connected to the host computer system
4 by driver software, the apparatus comprising:

5 management facade software that runs in the host computer system, that
6 controls data passing between the driver software and the storage device and
7 that retrieves attributes of the data service;

8 a federated bean that runs in the host computer system and exports an
9 interface containing methods that generate commands to the management
10 facade;

11 a mechanism that uses the lookup service to obtain a proxy to the
12 federated bean; and

13 a mechanism that responds to commands received from the management
14 terminal, and that uses the proxy to make method calls on the federated bean
15 interface to cause the management facade to control the data passing between
16 the driver software and the storage device and to retrieve data service attributes
17 in order to manage the data service.

1 10. The apparatus of claim 9 wherein the mechanism that responds to commands
2 received from the management terminal comprises a command line interface in
3 the management terminal.

1 11. The apparatus of claim 9 wherein the mechanism that responds to commands
2 received from the management terminal comprises a graphical user interface in
3 the management terminal.

1 12. The apparatus of claim 9 wherein the management facade software comprises a
2 SCSI terminal emulation interface layer inserted between the driver software and
3 the storage device, which interface layer makes the storage device appear as a
4 SCSI device.

- 1 13. The apparatus of claim 9 wherein the management facade software comprises:
2 a storage volume interface layer inserted between the driver software and
3 the storage device;
4 an additional data service interface layer between the storage volume
5 interface layer and the storage device and wherein the storage volume interface
6 layer diverts information passing between the driver software and the storage
7 device to the additional data service layer.
- 1 14. The apparatus of claim 9 wherein the distributed computer system comprises a
2 plurality of host computer systems each having at least one storage device
3 connected to the each host computer system by driver software and wherein the
4 management facade software comprises management facade software running
5 in each of the plurality of hosts that controls data passing between the driver
6 software and the storage device in the each host and that retrieves attributes of
7 the data service; and wherein a federated bean runs in each host computer
8 system and exports an interface containing methods that generate commands to
9 the management facade in the each host.
- 1 15. The apparatus of claim 14 wherein the mechanism that uses the lookup service
2 to obtain a proxy to the federated bean comprises a first mechanism that uses
3 the lookup service to obtain a first proxy to a first federated bean in one host
4 computer system and a second mechanism that uses the first proxy to control the
5 first federated bean retrieve a second proxy of a second federated bean running
6 in a second host.
- 1 16. The apparatus of claim 15 further comprising a third mechanism that uses the
2 second proxy to control the second federated bean from the first host computer
3 system.

- 1 17. A computer program product for managing a data service from a management
2 terminal in a distributed computer system having a host computer system with a
3 lookup service and at least one storage device connected to the host computer
4 system by driver software, the computer program product comprising a computer
5 usable medium having computer readable program code thereon, including:
6 management facade software that runs in the host computer system, that
7 controls data passing between the driver software and the storage device and
8 that retrieves attributes of the data service;
9 federated bean program code that can run in the host computer system
10 and that exports an interface containing methods that generate commands to the
11 management facade;
12 program code that uses the lookup service to obtain a proxy to the
13 federated bean program code; and
14 program code that responds to commands received from the management
15 terminal and uses the proxy to make method calls on the federated bean
16 interface to cause the management facade to control the data passing between
17 the driver software and the storage device and to retrieve data service attributes
18 in order to manage the data service.
- 19 18. The computer program product of claim 17 wherein the program code that uses
2 the proxy to make method calls on the federated bean interface comprises a
3 command line interface in the management terminal.
- 1 19. The computer program product of claim 17 wherein the program code that uses
2 the proxy to make method calls on the federated bean interface comprises a
3 graphical user interface in the management terminal.
- 1 20. The computer program product of claim 17 wherein the distributed computer
2 system comprises a plurality of host computer systems each having at least one

storage device connected to the each host computer system by driver software and the management facade software comprises management facade software running in each of the plurality of hosts that controls data passing between the driver software and the storage device in the each host and that retrieves attributes of the data service; and wherein a federated bean runs in each host and exports an interface containing methods that generate commands to the management facade in the each host.

21. The computer program product of claim 20 wherein the program code that uses the lookup service to obtain a proxy to the federated bean program code comprises program code that uses the lookup service to obtain a first proxy to a first federated bean in one host computer system and using the first proxy to control the first federated bean retrieve a second proxy of a second federated bean running in a second host.

22. The computer program product of claim 21 further comprising program code that uses the second proxy to control the second federated bean from the first host computer system.

23. Apparatus for managing a data service from a management terminal in a distributed computer system having a host computer system with a lookup service and at least one storage device connected to the host computer system by driver software, the apparatus comprising:

means operable in the host computer system, for controlling data passing between the driver software and the storage device and retrieving attributes of the data service;

federated bean means operable in the host computer system for exporting an interface containing methods that generate commands to the management facade;

means for using the lookup service to obtain a proxy to the federated bean; and
means responsive to commands received from the management terminal, for using the proxy to make method calls on the federated bean interface to cause the management facade to control the data passing between the driver software and the storage device and to retrieve data service attributes in order to manage the data service.

24. The apparatus of claim 23 wherein the distributed computer system comprises a plurality of host computer systems each having at least one storage device connected to the each host computer system by driver software and wherein the means operable in the host computer system, for controlling data passing between the driver software and the storage device comprises means running in each of the plurality of hosts for controlling data passing between the driver software and the storage device in the each host and that retrieves attributes of the data service; and wherein a federated bean means runs in each host computer system for exporting an interface containing methods that generate commands to the management facade in the each host.

25. The apparatus of claim 24 wherein the means for using the lookup service to obtain a proxy to the federated bean comprises first means for using the lookup service to obtain a first proxy to a first federated bean in one host computer system and second means for using the first proxy to control the first federated bean retrieve a second proxy of a second federated bean running in a second host.

26. The apparatus of claim 25 further comprising third means for using the second proxy to control the second federated bean from the first host computer system.